

Defense Advanced Research Projects Agency



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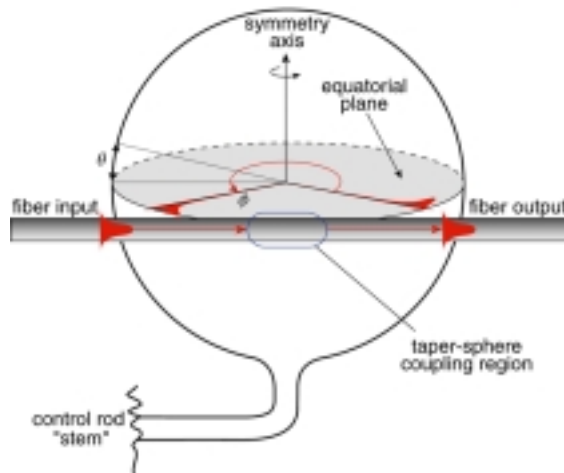
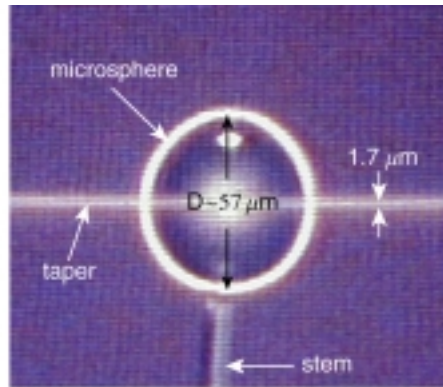
# Fiber-coupled microsphere lasers

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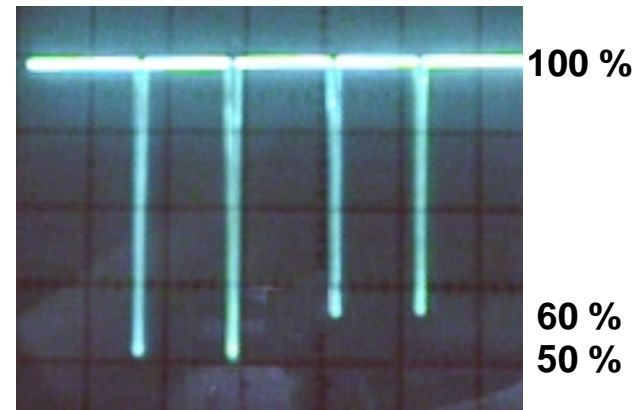
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# Fiber Taper Coupling to Microsphere WGMs

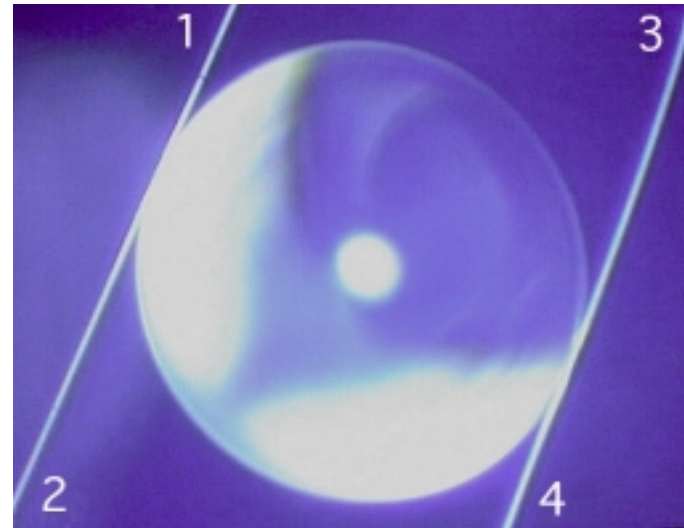
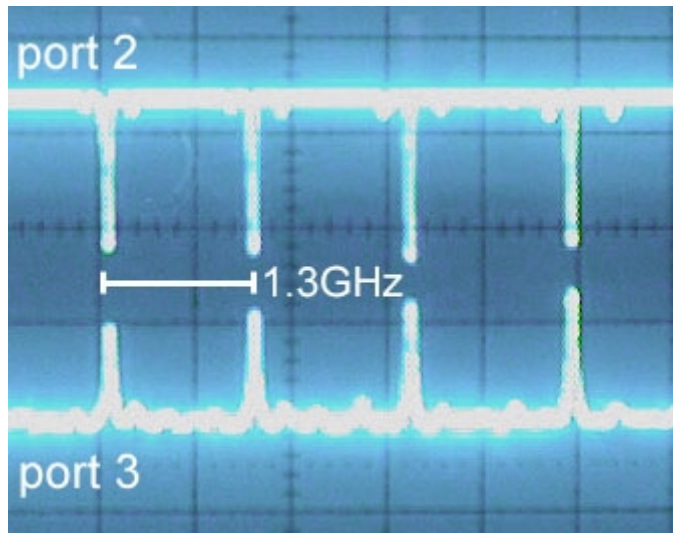


Transmission



# Four-port filter characteristics

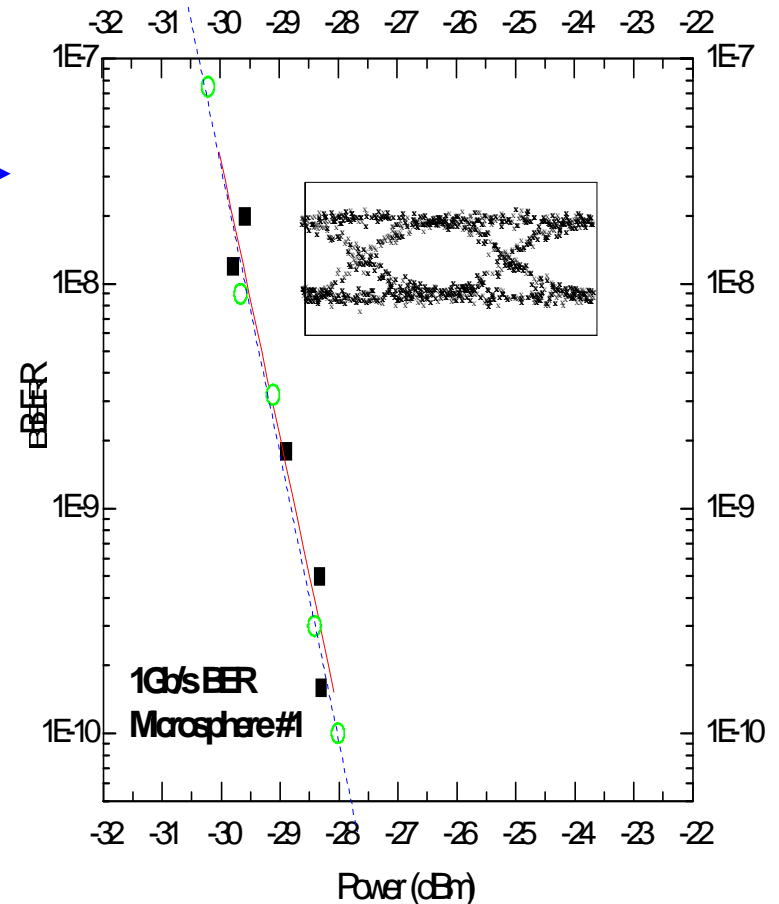
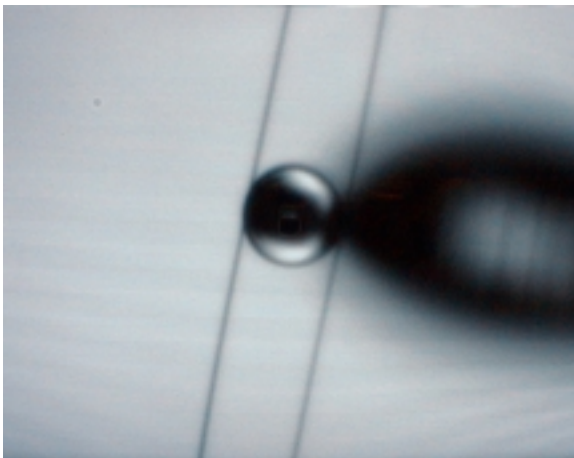
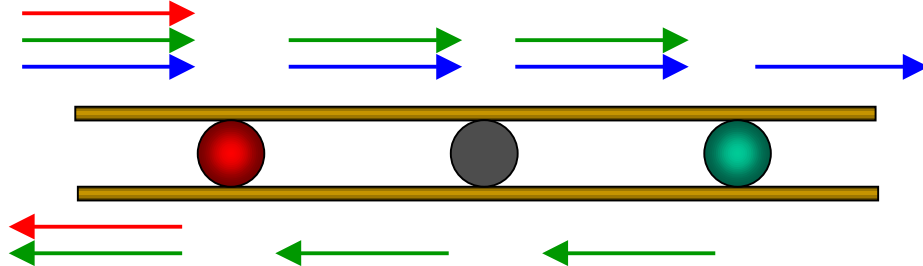
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- $P_2 / P_1$  resonant extinction  $> 28\text{dB}$
- Fully loaded  $Q \approx 10$  million (tapers and spheres touching)

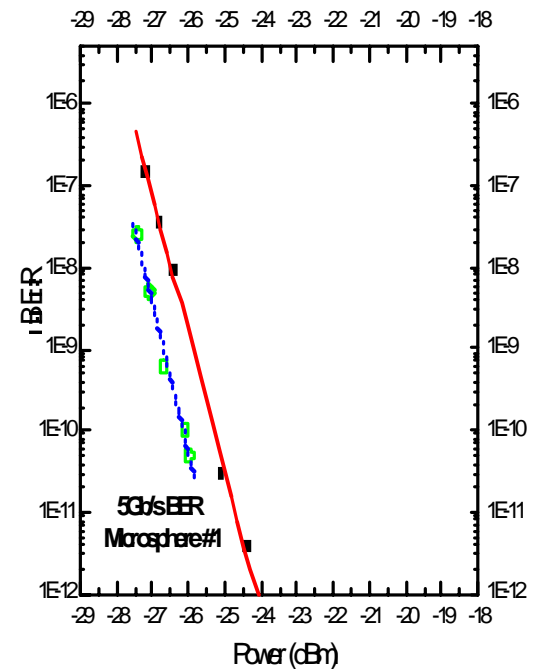
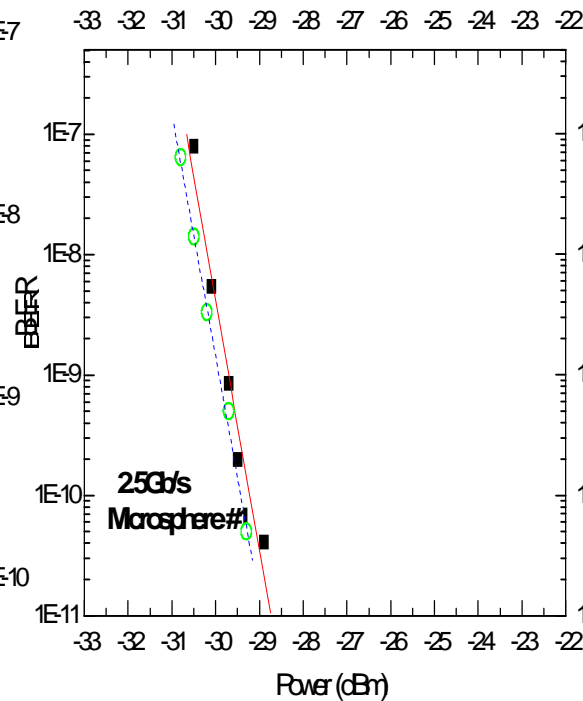
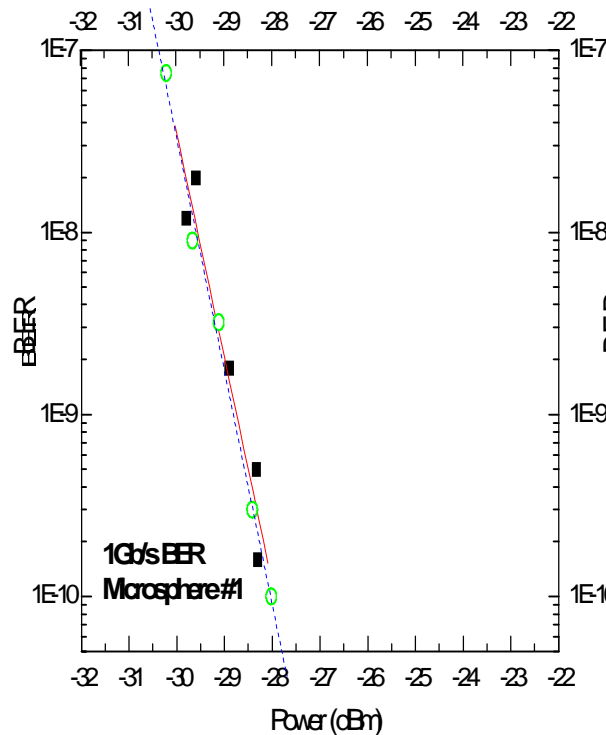
# Add/Drop Bit-Error-Rate Test

WDM Input



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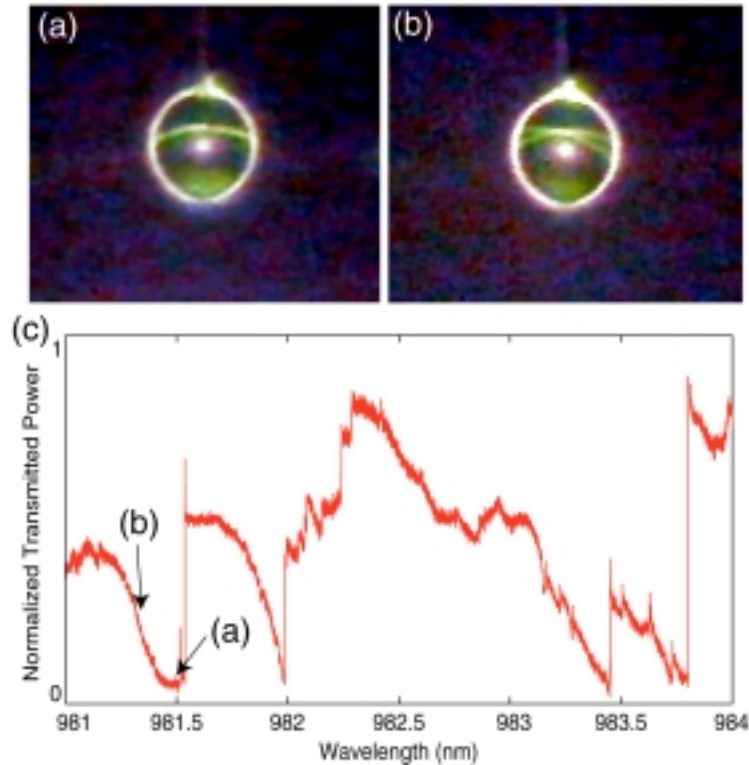
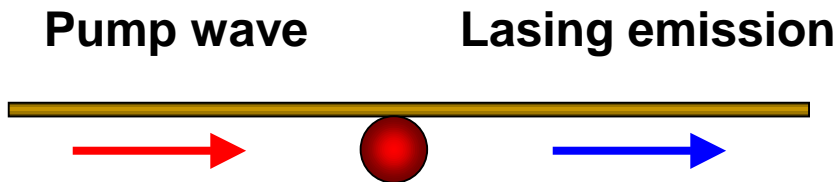
# BER vs. Bandwidth



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# Fiber pumped microsphere laser

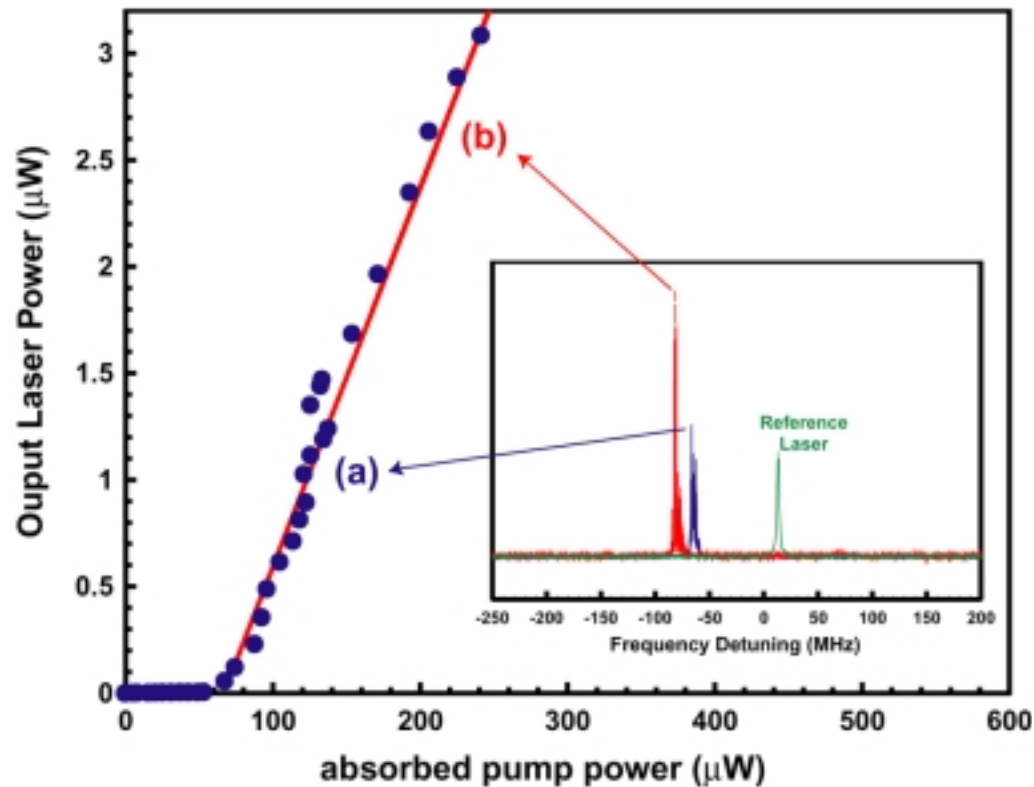
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# L-L Characteristic

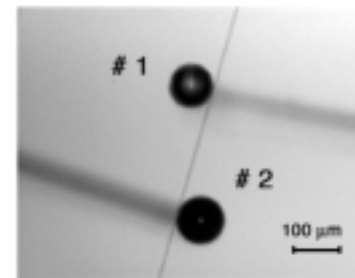
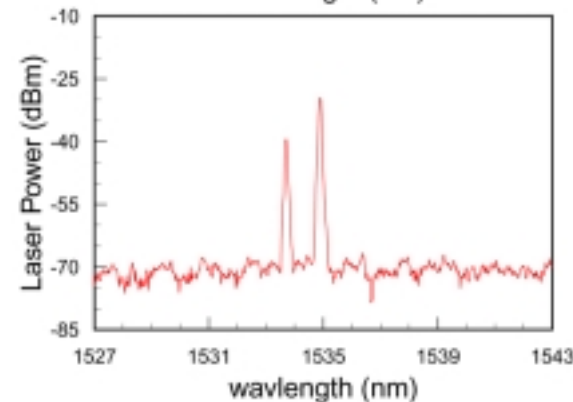
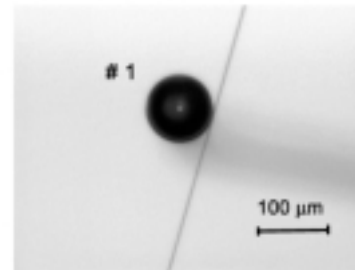
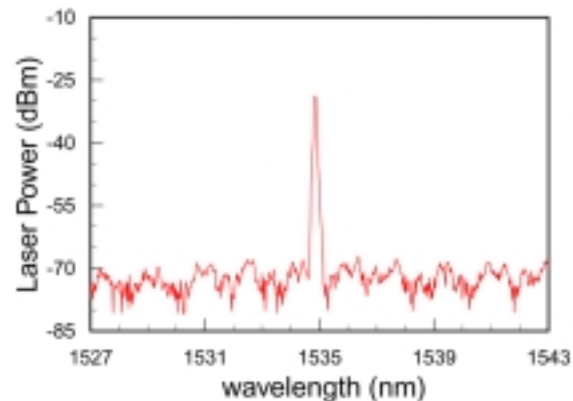
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# Tandem Microsphere Lasers

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# Summary

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- **Taper-to-sphere coupling is highly efficient.**
- **Preliminary demonstrations:**
  - (1) Filters. (All-fiber add/drops seem feasible at OC 192 rates).**
  - (2) Compact, fiber-compatible lasers.**